

REMARKS

Applicants thank the Examiner for allowing claims 7-9. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1-3, 5 and 7-9 remain pending in this application.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 2, 3 and 5 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Publication No. 2004/0107035 ("Tange"), in view of U.S. Patent Publication No. 2004/0153228 ("Matsumoto") and in further view of U.S. Patent No. 2003/0045983 ("Kondo"). Applicants respectfully traverse the rejection for the reasons set forth below.

As originally presented, claim 1 (*i.e.*, the claim from which claims 2, 3 and 5 depend) recites a steering control apparatus for an automotive vehicle. This steering control apparatus includes, among other possible things (*italic emphasis added*):

a camera photographing a travel path in a traveling direction of a vehicle;
a lateral displacement calculating circuit that calculates a lateral
displacement of the vehicle with respect to the travel path according to
an image of the travel path photographed by the camera;
a differentiator that calculates a differential value of the lateral displacement;
a vehicle speed sensor that detects a vehicle speed;
a relative yaw rate calculating section that calculates a relative yaw rate with
respect to the travel path of the vehicle on the basis of the lateral
displacement, the differential value of the lateral displacement, and the
vehicle speed;
an actuator that provides an assistance force for the steering mechanism; and
an actuator controlling section that drivingly controls the actuator in a
direction toward which the relative yaw rate is cancelled on the basis of
the relative yaw rate, wherein the actuator controlling section outputs
a steering torque command value to the actuator, the steering torque
command value being a sum of a steering quantity in accordance with
the driver's steering operation and the vehicle speed and a stability
direction quantity calculated on the basis of the calculated yaw rate.

Accordingly, the claimed invention calculates a relative yaw rate (a stability direction quantity) which is derived from the lateral displacement, the differential value of the lateral displacement and the vehicle speed. The lateral displacement information is obtained directly

via the claimed camera. Specifically, the lateral displacement of the vehicle with respect to the travel path is calculated according to an image of the travel path photographed by the camera. The yaw rate is a variation rate of the yaw angle of the vehicle. The variation rate of the yaw angle has a close relationship to the force developed on the vehicle due to yawing. Using an actuator, force is applied to a steering mechanism based on a sum of the stability direction quantity and a steering quantity. According to the claimed invention, the steering quantity is derived from the driver's steering operation and the vehicle speed. Accordingly, the obtained stability direction quantity and the steering quantity are used as a parameter by the actuator in determining the amount of force applied to the steering mechanism. This results in extremely accurate steering control.

In contrast, Tange, Matsumoto and Kondo (standing alone or combined) fail to teach or suggest the steering control apparatus recited in claim 1. Page 3 of the May 21, 2007, Office Action acknowledges that Tange et al. does not disclose, teach or suggest “the actuator is a steering actuator.” Further, page 4 of the Office Action acknowledges that the combination of Tange and Matsumoto fail to disclose an actuator controlling section that outputs a steering torque command value to the actuator, the steering torque command value being a sum of a steering quantity in accordance with the driver's steering operation and the vehicle speed and a stability direction quantity calculated on the basis of the calculated yaw rate.

In making the rejection, the Office Action relies on Kondo paragraphs 54-63. However, Kondo detects the yaw rate using a yaw rate sensor. (See ¶ 55.) In contrast, the claimed invention estimates the relative yaw rate using information received from the claimed camera. Neither Tange, Matsumoto or Kondo alone or in combination disclose a steering control apparatus including a camera photographing a travel path in a traveling direction of a vehicle and a lateral displacement calculating circuit that calculates a lateral displacement of the vehicle with respect to the travel path according to an image of the travel path photographed by the camera, “wherein the actuator controlling section outputs a steering torque command value to the actuator, the steering torque command value being a sum of a steering quantity in accordance with the driver's steering operation and the vehicle speed and

a stability direction quantity calculated on the basis of the calculated yaw rate” as claimed in claim 1.

M.P.E.P. § 2131 states that “[t]he identical invention must be shown in as complete detail as is contained in the claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989). Here, Kondo discloses a yaw rate sensor. (*See* P 55.) However, neither of the cited references disclose in any detail a steering control apparatus including a camera photographing a travel path in a traveling direction of a vehicle and a lateral displacement calculating circuit that calculates a lateral displacement of the vehicle with respect to the travel path according to an image of the travel path photographed by the camera, “wherein the actuator controlling section outputs a steering torque command value to the actuator, the steering torque command value being a sum of a steering quantity in accordance with the driver’s steering operation and the vehicle speed and a stability direction quantity calculated on the basis of the calculated yaw rate” as claimed in claim 1.

Further, the Office Action asserts that “it is well known in the art to vary steering control based on vehicle speed.” This Official Notice is respectfully traversed. As asserted in M.P.E.P. 2144.03, “It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. ” Thus, it is requested that the Examiner provide evidentiary support in the record as to the Official Notice taken, as per the guidelines set forth in the MPEP, or rescind the Official Notice.

Accordingly, Tange, Matsumoto and Kondo fail to teach or suggest at least the above-emphasized limitations of claim 1. Thus, Applicants respectfully request that the rejection be withdrawn and amended claim 1 be allowed. Claims 2, 3 and 5 depend from amended claim 1 and are allowable for the reasons set forth above without regard for further patentable limitation recited therein. Therefore, Applicants respectfully request that the rejection be withdrawn and claims 2, 3 and 5 be allowed.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date August 21, 2007

By 

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 945-6162
Facsimile: (202) 672-5399

Pavan K. Agarwal
Registration No. 40,888

W. Keith Robinson
Registration No. 59,396

Attorneys for Applicant